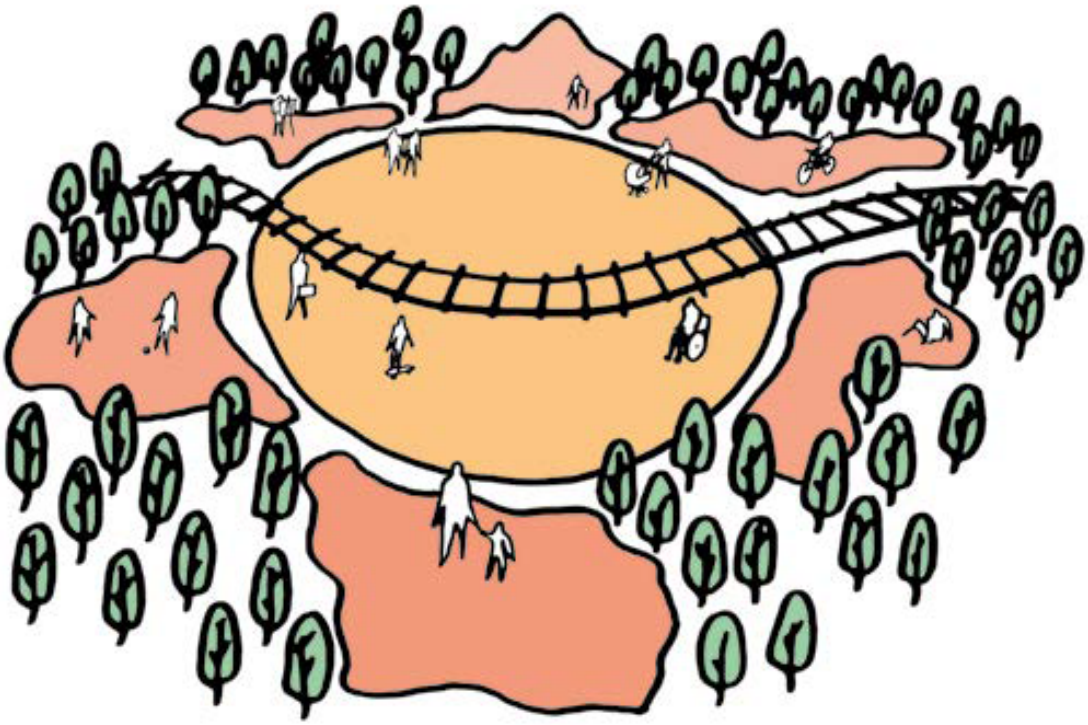
Harrogate District LOCAL PLAN

# New Settlement (Maltkiln) Development Plan Document (DPD)



# Flood Risk Sequential Assessment

October 2022

NORTH YORKSHIRE COUNCIL

From 1 April 2023

# Contents

# Region

# 1 Introduction

## Role and Purpose of the Report

1.1 Harrogate Borough Council is preparing a New Settlement Development Plan Document (DPD) to guide the design and delivery of a new settlement in a broad location at Green Hammerton/Cattal.

1.2 The DPD will allocate a site for the new settlement within the broad location and set out a policy framework to be used alongside relevant policies in the Harrogate District Local Plan 2014-2035 to determine applications for planning permission.

1.3 When identifying sites for development national planning policy, set out in the National Planning Policy Framework (NPPF) (2021), requires DPDs to apply a sequential risk based approach in order to avoid, where possible, flood risk to people and property.

1.4 This report sets out how this requirement has been met in proposing the draft site allocation included in the New Settlement Development Plan Document (DPD) Pre-submission Version (Regulation 19).

1.5 The remainder of the report is set out as follows:

- **Section 2:** The Sequential Approach to Flood Risk. This section summarises relevant national policy and explains the sequential approach achieved in the adopted Local Plan;
- **Section 3:** Green Hammerton/Cattal Broad Location for Growth. This section explains the rationale for identifying a broad location and introduces the new settlement options;
- **Section 4:** Sequential Assessment of New Settlement Options. This section sets out the flood risk sequential assessment of the options;
- **Section 5:** Conclusion. This section summarises the result of the assessment and draws conclusions.

## Local Plan Growth Strategy

1.6 The Harrogate District Local Plan 2014-2035 (adopted 2020) sets out the council's development strategy for the Harrogate district. This includes identifying the scale of new development required and setting out a strategy for accommodating this growth.

1.7 The council's growth strategy is set out in local plan policy GS2: Growth Strategy to 2035. It identifies that the need for new homes and jobs will be met as far as possible by focusing growth within:

1. The district's main settlements
2. Settlements on the key public transport corridors
3. A new settlement within the Green Hammerton/Cattal area

1.8 It goes on to state that the scale of development will reflect:

- The role of the settlement as defined by a settlement hierarchy;
- The character and setting of the settlement;
- The relationship of the settlement to the key public transport corridors;
- The need to deliver new homes and jobs;
- The need to maintain or enhance services and facilities in villages; and
- The capacity of infrastructure within the settlement and the time frame for any necessary investment and improvement

# 1 Introduction

**1.9** Under the local plan approach the majority of the district's development needs will be met through the delivery of sites within existing settlements allocated by further local plan policies in accordance with the growth strategy. The plan also makes provision for some need to be met by proposals brought forward on small unalllocated sites, known as windfall sites, where these accord with the growth strategy.

**1.10** The remaining need is planned to be met as part of the delivery of a new settlement in the Green Hammerton/Cattal area.

**1.11** Although a portion of the district's need for development up to 2035 will be met through the creation of a new settlement the local plan does not allocate a site for this development. Instead it identifies a broad location at Green Hammerton/Cattal where the development will take place, and includes a requirement to prepare a separate DPD to guide the detailed planning, including the allocation of a specific site.

**1.12** Within the local plan, policy DM4: Green Hammerton/Cattal Broad Location for Growth sets out further requirements for the New Settlement DPD. These include ensuring that the new settlement will be an exemplar of sustinable design and include appropriate measures to mitigate flood risk, including the use of sustainable drainage systems (SuDS).

# 2 The Sequential Approach to Flood Risk

## National Planning Policy

**2.1** National planning policies relevant to climate change, flooding and coastal change are set out in section 14 of the National Planning Policy Framework (NPPF) (2021).

**2.2** Within section 14, paragraph 161 requires that all plans apply a sequential risk-based approach to the location of development, which takes into account all sources of flood risk and the current and future impacts of climate change, in order to avoid, where possible, flood risk to people and property. It goes on to explain that this should be achieved through measures including the application of the sequential test and then, if necessary, the exception test.

**2.3** The aim of the sequential test, as described in paragraph 162, is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.

**2.4** The sequential test recognises that it may not always be possible to steer development to areas with no risk of flooding. However, in such situations an exception test may be required depending on the level of flood risk present and the vulnerability to flooding of the development type being considered. As set out in paragraph 163, in order to pass the exception test both of the following should be demonstrated:

1. the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
2. the development will be safe for its lifetime taking account of the vulnerability of its users without increasing flood risk elsewhere, and, where possible will reduce flood risk overall

**2.5** National guidance on the need for the exception test is set out in the Flood Risk and Coastal Change section of the Planning Practice Guidance (PPG). In simple terms where development more vulnerable to flooding is being considered on land at greater flood risk, there is a greater likelihood that exception testing will be required.

## Local Plan Approach to Flood Risk

**2.6** In response to flood risk the council's development strategy, set out in the adopted local plan, provides a sequential risk-based approach to the location of new development, as required by national planning policy.

**2.7** The approach has been informed by a flood risk sequential assessment of potential site allocations and consideration of flood risk when assessing the relative merits of locations for a new settlement.

**2.8** The sequential risk-based approach is maintained through the development management process when considering applications for planning permission.

**2.9** Where proposals are brought forward on sites allocated in the local plan following sequential assessment further sequential testing is not required unless a different development type is proposed. However, where proposals are brought forward on non-alllocated (windfall) sites not considered as part of preparing the local plan these must be accompanied by a sequential test and, where necessary, exception test.

# 2 The Sequential Approach to Flood Risk

## Sequential Approach to Selecting Local Plan Allocations

**2.10** The local plan allocates sites that will meet the majority of the district's development needs up to 2035. The allocation of sites followed consideration of flood risk through an assessment of potential site options, as part of the sustainability appraisal process,[1] and a flood risk sequential assessment[2].

**2.11** The sustainability appraisal and sequential assessment were based on the findings of a strategic flood risk assessment (SFRA) [3].

**2.12** The sustainability appraisal considered the impact of development on 16 overarching sustainability aims responding to a range of important social, economic and environmental issues. Potential sites were assessed against a series of detailed objectives derived from the overarching aims that included flood risk and land drainage. Sites where development was identified as having the greatest benefits and least impacts through this process were proposed as allocations.

**2.13** To ensure that sites would not be allocated where there were reasonably available alternative sites appropriate for the proposed development in areas with a lower risk of flooding, the decision to allocate sites was also based on a sequential assessment of site options informed by recommendations within the SFRA.

**2.14** The Local Plan Sequential Test highlights that the overwhelming majority of sites allocated for development in the local plan are at little or no risk of flooding as they are wholly located in flood zone one (river flooding) and have a low risk of surface water flooding. These sites were considered sequentially acceptable as they do not include land at risk of flooding.

**2.15** However, a small but still significant number of proposed allocations were identified as being at flood risk, primarily as a result of including land in either flood zone two, flood zone three or both of these zones, but also in some cases as a result of including land at risk of surface water flooding. These sites were considered further to understand whether each site would be sequentially acceptable.

**2.16** It was established that for all proposed allocations identified as at risk of river flooding the risk extends over only a small proportion of the site. In each case the proportion of land at risk was considered against reasonable assumptions of the site's net developable area to understand whether the site could still be developed whilst avoiding areas at risk. For all but one site it was concluded that the sites could be delivered on land not at risk (flood zone one) whilst avoiding development on land at risk (flood zones two and three).

**2.17** These sites were considered sequentially acceptable, subject to inclusion of appropriate mechanisms to ensure avoidance, as development would not take place on land at risk of flooding.

**2.18** On one small site in Pateley Bridge it was concluded that development could not take place whilst avoiding the small proportion of the site at risk as the location of the risk coincided with the only access point, but that the site could be delivered whilst avoiding residential development in this area. The site was considered further in the context of the growth strategy identifying a need for development in the settlement, the flood risk of other sites in the settlement, and the limited availability of alternative land within the settlement without other significant constraints.

1 The Local Plan Sustainability Appraisal is available at: www.harrogate.gov.uk/sa
2 The Local Plan Sequential Test Update (2018) is available at: www.harrogate.gov.uk/evidencebase
3 The Level 1 Strategic Flood Risk Assessment (2016) and the Level 1 Strategic Flood Risk Assessment Addendum (2018) are available at: www.harrogate.gov.uk/evidencebase

**2.19** The site was considered sequentially acceptable, subject to inclusion of appropriate mechanisms to ensure appropriate avoidance, as housing would not be located on land at risk of flooding.

**2.20** Further consideration of potential allocations identified as being at risk of surface water flooding led to the rejection of some sites at higher risk (land within the 1 in 30 year extent) and/or those with a large proportion at risk overall, particularly small sites where it was considered unlikely that surface water could be mitigated on-site. This included a site in Pateley Bridge.

**2.21** Some larger sites with land at risk of surface water flooding were retained as allocations on the basis that a satisfactory flood risk assessment that adequately addresses surface water risks would be required alongside the use of sustainable drainage systems (SuDS) to store and manage surface water, and the provision of green blue infrastructure.

**2.22** Through the sequential approach to flood risk, set out above, the local plan allocations successfully steer development to areas at lowest risk of river flooding.

**2.23** The delivery of local plan allocations will not result in the development of land at risk of river flooding, except in relation to one site, and in all cases delivery will not result in the development of housing on land at risk.

**Sequential Approach in Identifying a Broad Location for Growth**

**2.24** The local plan growth strategy includes the delivery of a new settlement however the plan does not allocate a site for this development. Instead it identifies a broad location at Green Hammerton/Cattal where development will take place and includes a requirement to prepare a separate DPD to guide the detailed planning, including the allocation of a specific site.

**2.25** Identification of the broad location has included consideration of flood risk. This is summarised in the New Settlement Background Paper[4] which draws together relevant information from the local plan evidence base, sets out the consideration of alternative options and proposals, and explains the decision making process and rationale behind the local plan approach.

**2.26** In developing the local plan approach allocating a specific site was initially investigated and the council assessed site options as part of the sustainability appraisal process. This included consideration of flood risk and land drainage, as described above in relation to local plan allocations.

**2.27** Consideration was also given to the relative flood risk on each site, informed by recommendations within the SFRA. This was to ensure that any allocation would be a sequentially acceptable new settlement option but also to confirm that the approach of delivering a new settlement would meet the wider local plan sequential test requirement when considered against alternative approaches.

**2.28** The sequential consideration identified that:

- **Three sites were wholly within flood zone 1.** Sites are not at risk of river flooding;
- **Three sites were over 98% flood zone 1 but included small areas within flood zones 2 and 3a.** Through appropriate layout and design sites can be delivered whilst avoiding development on land at risk;
- **One site was 83% flood zone 1 but also included 5% flood zone 2 and over 10% flood zone 3a.** The exception test would be required due to the extent of the site at high risk of flooding.

4 The New Settlement Background Paper (2017) is available at: www.harrogate.gov.uk/evidencebase

## 2 The Sequential Approach to Flood Risk

**2.29** It was concluded that the site requiring the exception test would not be a sequentially acceptable option, however, the remaining sites would each meet sequential test requirements as each option could be delivered whilst ensuring that development only takes place within flood zone 1.

**2.30** As the delivery of any of the sequentially acceptable options would not result in development on land at risk of river flooding this process confirmed that development of a new settlement would accord with the wider local plan sequential approach to flooding and ensure that the growth strategy successfully steers development to areas at lowest risk of river flooding.

**2.31** Consideration was also given to the risk of surface water flooding. The SFRA identified that each of the sequentially acceptable sites contain small areas at risk of surface water flooding, including land in the higher risk 1 in 30 year extent. The proportion of each site at risk of surface water flooding ranged from 4 to 11.5%, and the proportion of each site at higher risk ranged from 0.1 to 4%.

**2.32** The SFRA identified sites where it could be difficult to manage surface water risk effectively on-site and suggested their potential withdrawal. None of the sequentially acceptable sites mentioned above were included in this list.

**2.33** Nevertheless the SFRA makes a number of recommendations for the development of sites with areas of surface water risk. For larger sites, including all of those being considered for a new settlement, these include:

- Further investigation through a detailed site-specific flood risk assessment incorporating surface water flood risk management and potentially including surface water modelling;
- Management and re-use of surface water on-site;
- Leaving surface water flood prone areas as open greenspace, incorporating social and environmental benefits;
- Use of appropriate sustainable drainage systems (SuDS) where possible;
- Identification of whether the delineation of areas of critical drainage may be appropriate in consultation with North Yorkshire County Council, as the lead local flood authority, Yorkshire Water, relevant internal drainage boards and the Environment Agency

**2.34** Ultimately it was decided not to allocate a specific site for the new settlement in the local plan and instead to identify a broad location in which a site would be allocated by a subsequent development plan document (DPD).

**2.35** Local plan policy DM4 identifies a broad location for growth at Green Hammerton/Cattal for the new settlement. This approach was considered to meet the requirement for a sequential approach to flood risk as the broad location includes two sites that were promoted for allocation and assessed to be sequentially acceptable options.

# 3 Green Hammerton/Cattal Broad Location for Growth

## The Broad Location

**3.1** The council's growth strategy, set out in policy GS2 of the Harrogate District Local Plan 2014-2035, includes the delivery of a new settlement in a broad location at GreenHammerton/Cattal. The broad location is shown on the local plan key diagram, which illustrates the main elements of the growth strategy.

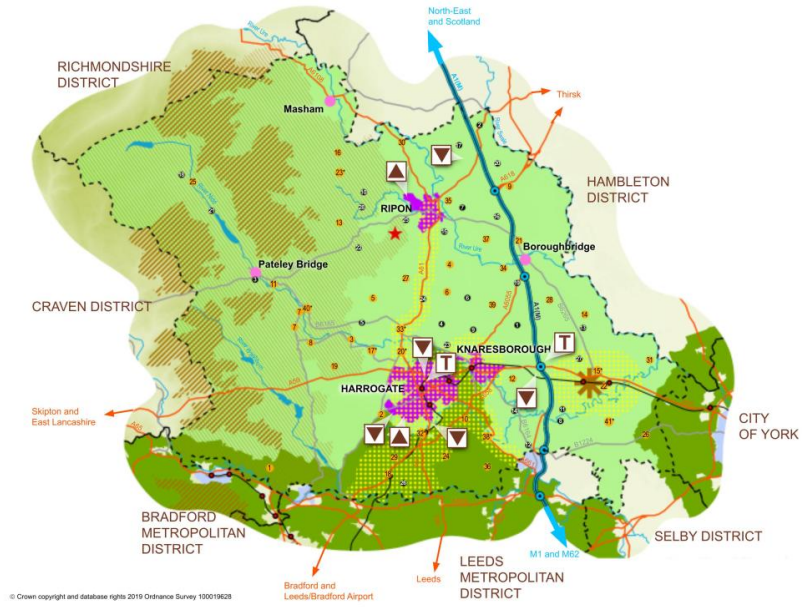



**Figure 3.1 Harrogate District Local Plan 2014-2035: Key Diagram**

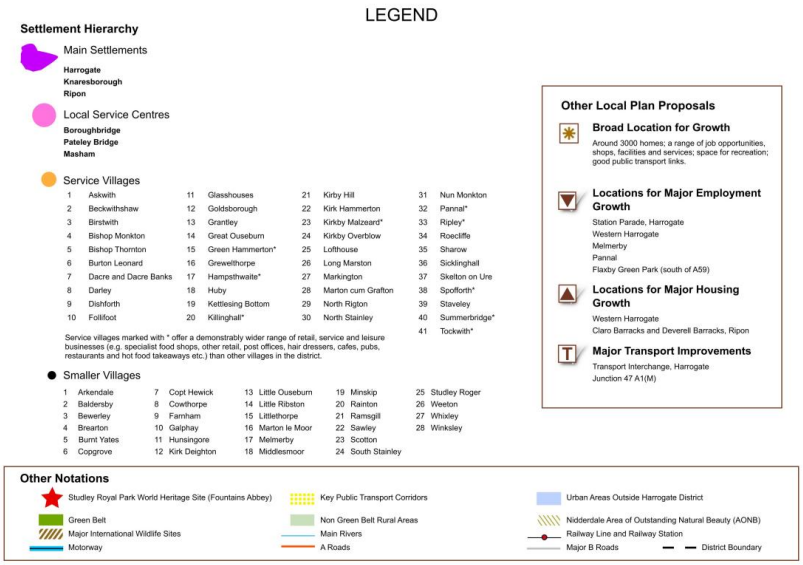



**Figure 3.2 Key Diagram Legend**

**3.2** The policy explains that a specific site for the new settlement within the broad location will be allocated by a separate New Settlement DPD. Local plan policy DM4: Green Hammerton/Cattal Broad Location for Growth sets out principles and requirements to guide the preparation of the DPD.

# 3 Green Hammerton/Cattal Broad Location for Growth

**3.3** The New Settlement Background Paper[(5)] draws together relevant information from the local plan evidence base, sets out the consideration of alternative options and proposals, and explains the decision making process and rationale behind this approach.

**3.4** It explains that the council initially assessed several specific sites across the district for suitability for a new settlement. This ultimately included two proposals within the area subsequently identified as the broad location. These options were pursued by different promoters who each, over the course of preparing the plan, developed and refined their proposal, including amending site boundaries as their land interests evolved, along with the supporting evidence.

**3.5** The council initially pursued the approach of allocating a specific site. At the draft local plan stage the council considered that, based on a comparative consideration of the alternatives then put forward, the preferred options were either Flaxby or Green Hammerton. At the later additional sites stage a preference was made for the Green Hammerton proposal.

**3.6** In preparing the publication stage draft plan the council considered the latest evidence and comments received as part of the consultation, including material provided by site promoters, and decided to continue to focus on the Green Hammerton option but to introduce additional flexibility to enable full consideration of adjoining land close to Cattal, which had also been promoted as an option.

**3.7** It was considered that the best way to progress this approach would be to identify a broad location at Green Hammerton/Cattal in the local plan rather than to allocate a site or land ownership defined boundary that had been promoted to date. A number of benefits of this approach are set out, including allowing consideration of the optimum boundary for a new settlement taking account of all key factors including land ownership, infrastructure and masterplanning requirements.

**3.8** The Green Hammerton/Cattal broad location for growth is shown below. It includes the land at Green Hammerton promoted by Commercial Estate Group (sites GH11 and GH12) during local plan preparation, as well as the land near Cattal promoted by Oakgate as Maltkiln (sites CA4 and CA5).

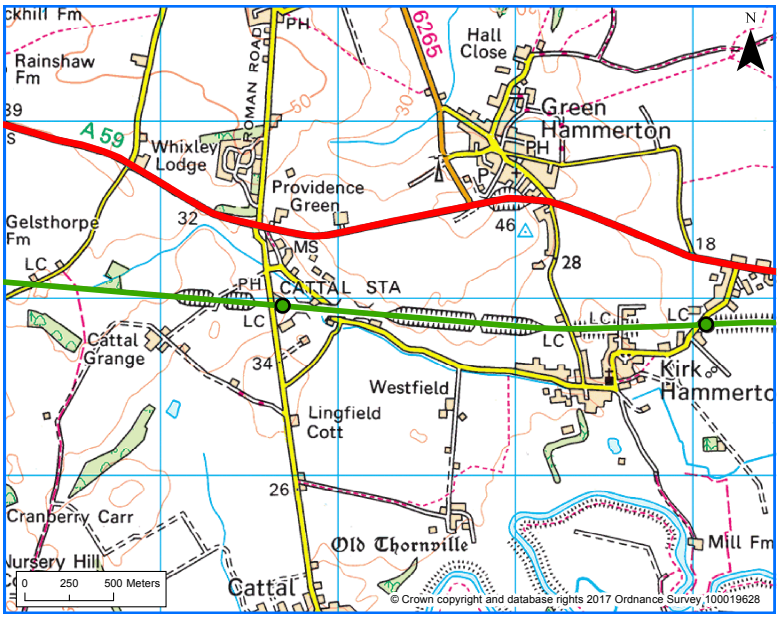



**Figure 3.3 Green Hammerton/Cattal Broad Location for Growth- as shown in: New Settlement Background Paper (Nov 2017)**

5 The New Settlement Background Paper (2017) is available at: www.harrogate.gov.uk/evidencebase

**3.9** As set out in section two the identification of the broad location is considered to allow the requirement for a sequential approach to flood risk to be met. This is because the broad location includes two sites that were promoted for allocation and assessed to be sequentially acceptable options.

**3.10** Either of these sites in the broad location could be delivered whilst ensuring that development takes place only within flood zone one. The ability to ensure that development takes place only within flood one and, therefore, that no development is on land at risk of river flooding means that the broad location approach is in-line with the wider local plan sequential approach, where allocations, in all but one case will not result in development of land at risk.

## New Settlement Options

**3.11** The council commissioned Gillespies supported by Vectos and Cushman and Wakefield to develop a vision and concept framework for a new settlement in the broad location that would form the basis of a New Settlement DPD early engagement (regulation 18) consultation document.

**3.12** This began with a baseline analysis of the broad location to identify key issues and opportunities. Together with targeted key stakeholder consultation this was used to develop an emerging vision based on nine strategic objectives and to identify potential spatial approaches.

**3.13** Three spatial options were identified. These were developed to ensure that a distinct range of spatial approaches could be investigated further. The spatial options are summarised below with further information available in the New Settlement Concept Framework. **(6)**

### Option 1: Central Focus

**3.14** This option focuses on the area north of the railway line between Cattal and Hammerton train stations, and incorporates the village edges of Green Hammerton and Kirk Hammerton.


**Figure 3.4 New Settlement Option 1: Central Focus**

6 The New Settlement Concept Framework and other Regulation 18 consultation material can be found at: www.harrogate.gov.uk/newsettlementdpd

# 3 Green Hammerton/Cattal Broad Location for Growth

**3.15** The key spatial characteristics of this option include:

- Housing between existing settlements and linked to a new central local centre;
- Separate employment area in the east, between Green Hammerton and Kirk Hammerton;
- Potential re-routed A59;
- Connections to Green Hammerton facilities.

### Option 2: North of Cattal Station Focus

**3.16** This option focuses on the area to the north of the railway line around Cattal station, with the majority of the development located south of the A59.

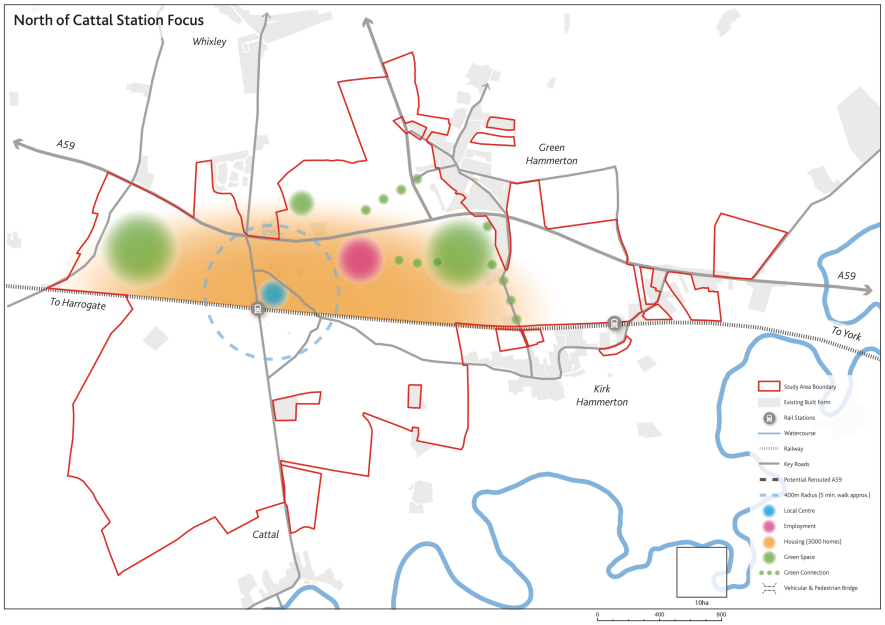



**Figure 3.5 New Settlement Option 2: North of Cattal Station Focus**

**3.17** The key spatial characteristics of this option include:

- Local centre and housing focused to the north of Cattal railway station and railway line in an elongated east-west orientation;
- Local centre located adjacent to railway station;
- Significant green space buffer maintained between development and Green Hammerton with improved green connections;
- Employment area located between new development and existing settlements.

### Option 3: Cattal Station Focus

**3.18** This option focuses on the area around Cattal station extending towards the south and south-west of the railway line.

# Green Hammerton/Cattal Broad Location for Growth 3

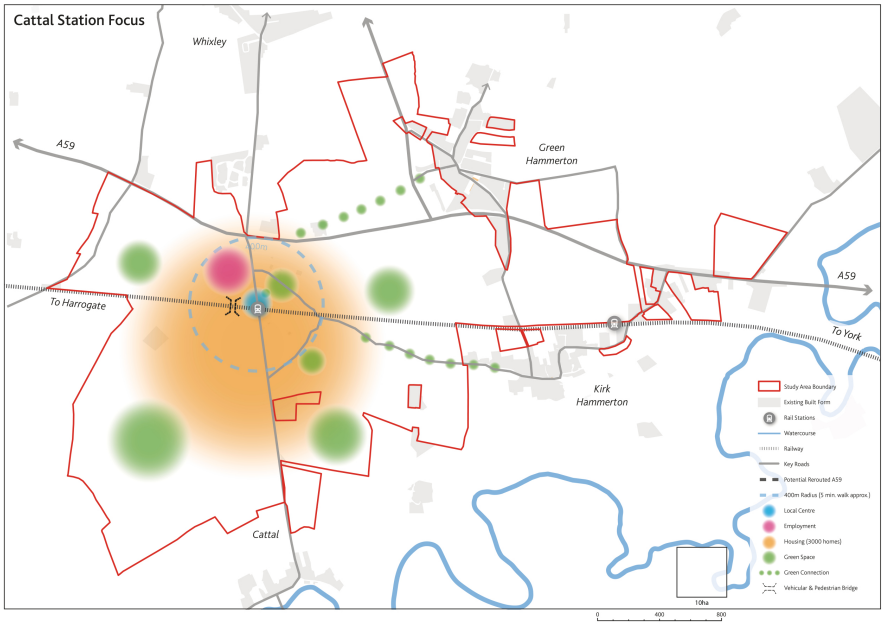



**Figure 3.6 New Settlement Option 3: Cattal Station Focus**

**3.19** The key spatial characteristics of this option include:

- Local centre and housing focused around Cattal station;
- Employment area near to Cattal station;
- Pockets of green space;
- Improved green links and new vehicular and pedestrian crossings.

# 4 Sequential Assessment of New Settlement Options

**4.1** A sequential assessment of the three spatial options identified in the concept framework produced by Gillespies and included in the Regulation 18 consultation document has taken place. The assessment is based on the findings of the council's strategic flood risk assessment (SFRA) [(7)].

**4.2** To accord with the wider local plan sequential approach to flood risk and in recognition of the earlier sequential consideration of sites promoted for a new settlement, the starting aim for the assessment is to identify options where delivery can occur without developing on land at risk of river flooding (flood zones two and three).

**4.3** The sequential assessment has been carried out in-line with national policy set out in the National Planning Policy Framework (NPPF) (2021) and described in section two. The approach differs slightly from that used during the development of the local plan, which was prepared under an earlier version of the NPPF from 2012.

**4.4** Under current national policy there is an explicit requirement for sequential testing to take into account all sources of flood risk. Although the SFRA considers flood risk from all sources the site recommendations, which informed the local plan sequential test, were based primarily on the risk of river flooding. Sites with surface water flood risk were identified but largely considered sequentially acceptable unless the area at risk and the level of this risk suggested that managing surface water on-site could prove difficult.

**4.5** This assessment takes a wider approach by actively seeking to avoid areas at risk of surface water flooding. It is considered that this approach takes account of updated national policy and delivers more effectively on the aim of sequential testing, which is to steer development to areas with the lowest probability of flooding.

**4.6** The approach is also considered appropriate in recognition of limitations in the flood zone dataset, which may not fully identify flood zones associated with the Gelsthorpe Gutter and the upper reaches of the Kirk Hammerton Beck, since surface water flood risk is identified along these watercourses in these areas. The avoidance approach is also consistent with the SFRA recommendation of leaving surface water flood prone areas on larger sites as open green space and exploiting their potential to deliver social and environmental benefits, including climate change resilience.

**4.7** Consideration has also been given to areas susceptible to groundwater flooding. The SFRA uses the Environment Agency's Areas Susceptible to Groundwater Flooding dataset but cautions that it does not show the likelihood of groundwater flooding occurring, rather it indicates where geological and hydrogeological conditions show that groundwater might emerge. It goes on to explain that the low resolution dataset, which uses one kilometre grid squares, is not suitable for planning considerations at a site-specific level and should only be used as a trigger for further investigation of risk.

**4.8** Due to the limitations identified, in particular the fact that the dataset does not indicate whether land is at risk of flooding, which could be dependent on factors such as the length and intensity of rainfall events, in-bank river levels, artificial structures and the potential for groundwater and mine water rebound, it is not considered appropriate to give this data full weight when seeking to avoid areas at risk of flooding through the sequential test. Instead this information is included so account can be taken when designing development, for example, to avoid basements and cellars, and to highlight where further investigation may be necessary.

7 The Level 1 Strategic Flood Risk Assessment (2016) and the Level 1 Strategic Flood Risk Assessment Addendum (2018) are available at: www.harrogate.gov.uk/evidencebase

**4.9** National policy also requires that sequential testing takes account of the predicted impacts of climate change on flood risk. In light of this and the local plan requirement that the new settlement be an exemplar of sustainable design, it is considered appropriate to further widen the aim for the sequential assessment so that it seeks to identify options where delivery can occur without developing on land at risk of river or surface water flooding both now and in the future.

**4.10** The SFRA considers climate change, however, it identifies that modelled climate change outputs for the district were unavailable to inform the work.

**4.11** In place of modelled outputs a precautionary but pragmatic approach is taken to identify the effects of climate change on the risk of river flooding, where flood zones two and three are used as a proxies to provide an indication of future risk. Under this approach the assumption should be that the current flood zone two will become flood zone 3a in 100 years time, and the current flood zone 3a could become the future functional floodplain (flood zone 3b).

**4.12** Unfortunately a convenient proxy for the future flood zone two is not available. The SFRA suggests that where sites include land in flood zone one in close proximity to flood zones two or 3a, it should be recognised that some of this land may become the future flood zone two.

**4.13** In applying the SFRA approach it is noted that identifying an option where development will not take place in current flood zones two or three is likely to also ensure that development will not take place in future flood zone three. However, it is also recognised that this approach will not be sufficient to ensure that no development takes place in future flood zone two.

**4.14** The SFRA does not fully account for climate change against updated climate change allowances as required by current national planning guidance. At the same time it is recognised that the SFRA approach is not sufficient to ensure avoidance of future flood zone two or additional areas at risk of surface water flooding due to climate change.

**4.15** Nevertheless it is considered that a sequentially acceptable option can still be identified and the site allocated based on the SFRA subject to:

- The site containing sufficient available land to ensure that delivery does not include development on land at current or future risk of river or surface water flooding whilst accommodating at least the minimum quantum of development required by policy DM4;
- A requirement for any development proposals to be based on an acceptable site-specific flood risk assessment that includes identification of land at risk of future flooding as a result of climate change using appropriate and up-to-date climate change allowances, and ensures that land at risk of current or future river or surface water flooding is not developed but is incorporated as part of the green blue infrastructure network.

**4.16** As the three options have been identified from within a single wider extent of available land within the broad location the boundaries of options are not fixed and flexibility exists around each option. This flexibility allows allocation boundaries to be set so that sites include comfortably more than sufficient land to deliver the minimum quantum of development required by the local plan whilst avoiding development on land known to be at risk of flooding now and in the future, and also avoiding development on further land that is likely to be found to be at risk now or in the future through a site-specific flood risk assessment (FRA).

**4.17** The sequential consideration of each option is set out in the tables below:

# 4 Sequential Assessment of New Settlement Options

| Option 1: Central Focus | |
|---|---|
| Proposed use | New settlement |
| River flooding | The option is shown as wholly within flood zone 1. Kirk Hammerton Beck flows north-west to south-east through the south-western corner of the option. It is noted that limitations of the national dataset mean it may not fully identify flood zones across the option, particularly around Kirk Hammerton Beck, and, therefore, detailed modelling or further evidence may be required alongside a planning application |
| Surface water flooding | The vast majority of the option is at little or no risk of flooding from surface water (the chance of flooding is less than 1 in 1000 (0.1%)). However there are a number of areas where the risk is currently higher. These areas tend to have a high-risk (1 in 30) extent as well wider extents that would be impacted by the larger 1 in 100 and 1 in 1000 year events. Topographical information identifies that land at risk is centred on low lying areas where permanent surface water features such as ponds and streams are present. Large parts of the option, including the higher ground, are unaffected. There is a concentration of discreet areas at risk in the south-eastern corner near to Kirk Hammerton Lane. Other land affected is associated with the Kirk Hammerton Beck in the south-western corner, and a potentially ephemeral watercourse in the north. |
| Groundwater | Approximately 65% of the option is shown as having a low risk of groundwater emergence of less than 25%. A further 25%, around Kirk Hammerton Lane, is shown at medium risk (25-50%). To the south of this, around Parker Lane, the risk is high (50-75%) on around 10% of the area. There are no areas of very high risk (greater than 75%). |
| Consideration | As the SFRA shows the option to be 100% flood zone one it suggests that delivery would not result in development on land at risk of river flooding. It is recognised that limitations in the dataset mean there may be small areas at risk around the Kirk Hammerton Beck in the south-west corner of the option, however, it is considered that, should further investigation find this to be the case, there is sufficient available land to ensure the option could still be delivered without developing land at risk by avoiding these areas.<br><br>Although the vast majority of the option is not at risk of surface water flooding there is risk in some areas, including along the course of the Kirk Hammerton Beck. It is considered that there is sufficient available land to ensure the option can be delivered without developing on these areas at risk.<br><br>Most of the option has a low risk of groundwater emergence, however, approximately a third of the site has a higher risk. This should influence the design of any development in order to reduce any risk to property and may require further investigation. |
| Conclusion | The option is considered sequentially acceptable as delivery can occur whilst ensuring that development will not take place on land known to be at risk of river or surface water flooding now and in the future. In addition there is sufficient available land to ensure that site allocation boundaries can be set so that any further land identified as at risk of river or surface water flooding now or in the future through a site-specific FRA can remain undeveloped whilst still accommodating at least the minimum quantum of development required by the local plan.<br><br>To accord with the sequential test findings any development proposals would need to be based on an acceptable site-specific flood risk assessment (FRA) that includes adequate further investigation of the flood risk characteristics of the Kirk Hammerton Beck; as well as identification of any further land at flood risk due to climate change using appropriate and up-to-date climate change allowances. Proposals would then need to ensure that land at risk of current or future river or surface water flooding is not developed and instead is incorporated as part of the green blue infrastructure network. |

**Table 4.1 Sequential assessment of option 1: Central focus**

| Option 2: North of Cattal Station Focus | |
|---|---|
| Proposed use | New settlement |
| River flooding | The option is shown as wholly within flood zone 1. Gelsthorpe Gutter/Kirk Hammerton Beck flows broadly west to east through the western and central sections of the option. It is noted that limitations of the national dataset mean it may not fully identify flood zones across the option, particularly around Gelsthorpe Gutter/Kirk Hammerton Beck, and therefore detailed modelling or further evidence may be required alongside a planning application. |
| Surface water flooding | The vast majority of the option is at little or no risk of flooding from surface water (the chance of flooding is less than 1 in 1000 (0.1%)). However there are a number of areas where the risk is currently higher. These tend to have a high-risk (1 in 30) extent as well wider extents that would be impacted by the larger 1 in 100 and 1 in 1000 year events. Topographical information identifies that land at risk is centred on low lying areas where permanent surface water features such as ponds and streams are present. Due to higher ground in the east most of the affected land is in the west of the option and is located close to the course of the Gelsthorpe Gutter/Kirk Hammerton Beck. |
| Groundwater | Approximately 80% of the option is shown as having a low risk of groundwater emergence of less than 25%. A further 15% of the option is shown at medium risk (25-50%); this is predominantly located in the east of the option (around Kirk Hammerton Lane) with a smaller area close to Cattal station. A further 5% of the option, in the south-east corner around Parker Lane, is shown at high risk (50-75%). There are no areas of very high risk (greater than 75%). |
| Consideration | As the SFRA shows the option to be 100% flood zone one it suggests that delivery would not result in development on land at risk of river flooding. It is recognised that limitations in the dataset mean there may be small areas at risk around the Gelsthorpe Gutter/Kirk Hammerton Beck in the western and central sections of the option, however, it is considered that, should further investigation find this to be the case, there is sufficient available land to ensure the option could still be delivered without developing land at risk by avoiding these areas.<br><br>Although the vast majority of the option is not at risk of surface water flooding there is risk in some areas, predominantly along the course of the Gelsthorpe Gutter/Kirk Hammerton Beck. It is considered that there is sufficient available land to ensure the option can be delivered without developing on these areas at risk.<br><br>Most of the option has a low risk of groundwater emergence, however, approximately a fifth of the site has a higher risk. This should influence the design of any development in order to reduce any risk to property and may require further investigation. |
| Conclusion | The option is considered sequentially acceptable as delivery can occur whilst ensuring that development will not take place on land known to be at risk of river or surface water flooding now and in the future. In addition there is sufficient available land to ensure that site allocation boundaries can be set so that any further land identified as at risk of river or surface water flooding now or in the future through a site-specific FRA can remain undeveloped whilst still accommodating at least the minimum quantum of development required by the local plan.<br><br>To accord with the sequential test findings any development proposals would need to be based on an acceptable site-specific flood risk assessment (FRA) that includes adequate further investigation of the flood risk characteristics of the Gelsthorpe Gutter/Kirk Hammerton Beck; as well as identification of any further land at flood risk due to climate change using appropriate and up-to-date climate change allowances. Proposals would then need to ensure that land at risk of current or future river or surface water flooding is not developed and instead is incorporated as part of the green blue infrastructure network. |

**Table 4.2 Sequential assessment of option 2: North of Cattal station focus**

# 4 Sequential Assessment of New Settlement Options

| Option 3: Cattal Station Focus | |
|---|---|
| Proposed use | New settlement |
| River flooding | Approximately 90-95% of the option is shown within flood zone 1. The remaining 5-10%, around Kirk Hammerton Beck in the east of the option, is shown as being at risk of river flooding. While flood zone 3b (the floodplain) is not shown or negligible the majority of this area is at high risk (flood zone 3a), a smaller area is shown as flood zone 2. Away from areas shown at risk, Gelsthorpe Gutter/Kirk Hammerton Beck flows broadly west to east through the northern part of the option. It is noted that limitations of the national dataset mean it may not fully identify flood zones across the option, particularly around Gelsthorpe Gutter/Kirk Hammerton Beck in the west and centre of the option, and therefore detailed modelling or further evidence may be required alongside a planning application. |
| Surface water flooding | The vast majority of the site is at little or no risk of flooding from surface water (the chance of flooding is less than 1 in 1000 (0.1%)). However there are a number of areas where the risk is currently higher. These tend to have a high-risk (1 in 30) extent as well wider extents that would be impacted by the larger 1 in 100 and 1 in 1000 year events. Topographical information identifies that land at risk is centred on low lying areas where permanent surface water features such as ponds and streams are present. Most of the affected land is located close to the course of the Gelsthorpe Gutter/Kirk Hammerton Beck, however, there are also discreet areas of risk across the option associated with existing ponds or similar features, some of which may be ephemeral. |
| Groundwater | Approximately 65% of the option is shown as having a low risk of groundwater emergence of less than 25%. A further 30%, stretching south from Cattal station, is shown at medium risk (25-50%). In addition around 5% of the option, in the south-east corner near to Planetree Lane, is shown at high risk (50-75%). There are no areas of very high risk (greater than 75%). |
| Consideration | Although the SFRA identifies that around 10% of the option is at risk of river flooding, with the land affected located close to Kirk Hammerton Beck in the east of the option, it is considered that there is sufficient available land to ensure the option could still be delivered without developing land at risk by avoiding these areas. It is recognised that limitations in the dataset mean there may be further areas at risk around the Gelsthorpe Gutter/Kirk Hammerton Beck in the in the west and centre of the option, however, it is considered that, should further investigation find this to be the case, there is still sufficient available land to ensure the option could be delivered without developing land at risk by avoiding these areas.<br><br>Although the vast majority of the option is not at risk of surface water flooding there is risk in some areas, including along the course of the Gelsthorpe Gutter/Kirk Hammerton Beck. It is considered that there is sufficient available land to ensure the option can be delivered without developing on these areas at risk.<br><br>Most of the option has a low risk of groundwater emergence, however, approximately a fifth of the site has a higher risk. This should influence the design of any development in order to reduce any risk to property and may require further investigation. |
| Conclusion | The option is considered sequentially acceptable as delivery can occur whilst ensuring that development will not take place on land known to be at risk of river or surface water flooding now and in the future. In addition there is sufficient available land to ensure that site allocation boundaries can be set so that any further land identified as at risk of river or surface water flooding now or in the future through a site-specific FRA can remain undeveloped whilst still accommodating at least the minimum quantum of development required by the local plan.<br><br>To accord with the sequential test findings any development proposals would need to be based on an acceptable site-specific flood risk assessment (FRA) that includes adequate further investigation of the flood risk characteristics of the Gelsthorpe Gutter/Kirk Hammerton Beck; as well as identification of any further land at flood risk due to climate change using appropriate and up-to-date climate change allowances. |

| Option 3: Cattal Station Focus | |
|---|---|
| | Proposals would then need to ensure that land at risk of current or future river or surface water flooding is not developed and instead is incorporated as part of the green blue infrastructure network. |

**Table 4.3 Sequential assessment of option 3: Cattal station focus**

# 5 Conclusion

**5.1** A flood risk sequential assessment of the three new settlement options identified in the concept framework produced by Gillespies, and included in the Regulation 18 consultation document has taken place. The details of this assessment are set out in section four.

**5.2** The assessment concludes that all three options are sequentially acceptable and, therefore, could be selected as the new settlement allocation on flood risk grounds.

**5.3** The assessment identifies that while all of the options have a low risk of flooding overall, each option does contain small areas at risk. Nevertheless it concludes that there is sufficient available land associated with each option to ensure that whichever is selected no development will take place on land at risk of river or surface water flooding currently or in the future due to climate change, whilst still accommodating at least the minimum quantum of development required by local plan policy DM4.

**5.4** It is therefore concluded that a site allocated in accordance with this assessment will be successful in steering development away from areas at flood risk now and in the future.

**5.5** To ensure that development achieves this outcome it will necessary to require the site-specific flood risk assessment (FRA) that accompanies any development proposal to include:

- Appropriate further evidence of the flood risk characteristics of the Kirk Hammerton Beck and its tributaries to the satisfaction of the Environment Agency;
- Identification of land at risk of future river or surface water flooding as a result climate change using appropriate and up-to-date Environment Agency climate change allowances

**5.6** Proposals should then be required to demonstrate that, based on the FRA, no development will take place on land at risk of flooding currently or in the future due to climate change.

**5.7** It is recommended that areas identified as at risk of flooding are incorporated into the green blue infrastructure network to provide multifunctional benefits, including surface water storage, where appropriate, and opportunities for improved health and wellbeing.